

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
25 March 2004 (25.03.2004)

PCT

(10) International Publication Number
WO 2004/024078 A2

(51) International Patent Classification⁷: **A61K**

126 East Lincoln Avenue, Rahway, NJ 07065-0907 (US).

ROBINSON, Kyle, A. [US/US]; 126 East Lincoln Avenue, Rahway, NJ 07065-0907 (US).

(21) International Application Number:
PCT/US2003/028366

(74) Common Representative: **MERCK & CO., INC.**; 126 East Lincoln Avenue, Rahway, NJ 07065-0907 (US).

(22) International Filing Date:
10 September 2003 (10.09.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/409,741 11 September 2002 (11.09.2002) US

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(71) Applicant (*for all designated States except US*): **MERCK & CO., INC.** [US/US]; 126 East Lincoln Avenue, Rahway, NJ 07065-0907 (US).

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(72) Inventors; and

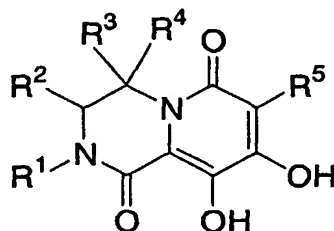
(75) Inventors/Applicants (*for US only*): **WAI, John, S.** [US/US]; 126 East Lincoln Avenue, Rahway, NJ 07065-0907 (US). **KIM, Boyoung** [KR/US]; 126 East Lincoln Avenue, Rahway, NJ 07065-0907 (US). **FISHER, Thorsten, E.** [US/US]; 126 East Lincoln Avenue, Rahway, NJ 07065-0907 (US). **ZHUANG, Linghang** [CN/US]; 126 East Lincoln Avenue, Rahway, NJ 07065-0907 (US). **WILLIAMS, Peter, D.** [US/US]; 126 East Lincoln Avenue, Rahway, NJ 07065-0907 (US). **LYLE, Terry, A.** [US/US]; 126 East Lincoln Avenue, Rahway, NJ 07065-0907 (US). **LANGFORD, H. Marie** [US/US];

Published:

— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: DIHYDROXYPYRIDOPYRAZINE-1,6-DIONE COMPOUNDS USEFUL AS HIV INTEGRASE INHIBITORS



(I)

(57) Abstract: 8,9-Dihydroxydihydropyridopyrazine-1,6-diones and 8,9-dihydroxypyridopyrazine-1,6-diones are inhibitors of HIV integrase and inhibitors of HIV replication. In one embodiment, the pyridopyrazinediones are of Formula (I): (I), wherein R¹, R², R³, R⁴ and R⁵ are defined herein. The compounds are useful in the prevention and treatment of infection by HIV and in the prevention, delay in the onset, and treatment of AIDS. The compounds are employed against HIV infection and AIDS as compounds per se or in the form of pharmaceutically acceptable salts. The compounds and their salts can be employed as ingredients in pharmaceutical compositions, optionally in combination with other antivirals, immunomodulators, antibiotics or vaccines. Methods of preventing, treating or delaying the onset of AIDS and methods of preventing or treating infection by HIV are described.